

WHISKEYTOWN RESERVOIR AQUATIC PLANT PERIMETER INVENTORY

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By

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The Klamath Region is noted for high proportions of rare and locally endemic plant species. Wetland and riparian, and aquatic plant habitats are undersampled in most of the Klamath Parks. These environments often harbor rare and unique species, and they are often heavily threatened by exotic species. Thirteen species of nonindigenous aquatic plants have been identified through the USGS Nonindigenous Aquatic Species list as potentially present in our parks (<http://nas.er.usgs.gov/>). Five of the species (*Cotula coronopifolia*, *Egeria densa*, *Myriophyllum spicatum*, *Potamogeton crispus*, and *Spirodela punctata*) have been identified from three of the parks (LAVO, REDW, and WHIS). The same three parks have public recreational boating (LAVO, REDW, and WHIS), the most common method for the distribution of nonindigenous aquatic species (Bratager 1996).

Reservoirs such as Whiskeytown present a conundrum in resource management, because they are a nonindigenous ecosystem that nonetheless supports populations of native and non-native plant and animal species.

Reservoir Ecology

Because plants need light to produce food, they are restricted to areas where light can penetrate the water. Aquatic plants are often restricted to the shallow areas and lake margins; these areas are most affected by reservoir drawdown. As a result of reservoir drawdowns reservoirs have limited and irregular littoral zones (Thorton et al. 1990, National Park Service 2004). The amount and rate of drawdown effects what type of plants can grow in a reservoir. Reservoirs often have low diversity and r selected species (Thorton et al. 1990, National Park Service 2004). The presence of caused human stresses also results in accelerated succession rates in reservoirs (Thorton et al. 1990, National Park Service 2004).

Whiskeytown Lake Background

In 1963 president Kennedy made a speech dedicating the Whiskeytown Dam, which created Whiskeytown Lake. Whiskeytown Lake covers 3,220 surface acres with 240,000 acre-feet of water at full capacity which is 1210 ft. above sea-level. Whiskeytown Dam impounds the Clear Creek watershed on the southeast end of the recreation area and the lake is fed by seven major watersheds, Clear Creek, Brandy Creek, Crystal Creek, Boulder Creek, Mill Creek, Willow Creek, and Whiskey Creek.

The entire shoreline of Whiskeytown Lake is considered a wetland, because of the seasonably stable height of the lake and its associated vegetation. Operation of the lake

by the Bureau of Reclamation (BOR) maintains two seasonal shorelines, full pool at 1,210 feet above sea level during the summer and approximately 1,193 feet during the winter season. The standard operations of the BOR raises the lake elevation in April or May for the summer to accommodate recreation and lowers the level in October or November for winter flood protection of the Sacramento River. These two discrete water levels form a seasonal zone of inundation that fluctuates fifteen to twenty feet vertically and about forty to fifty feet horizontally based on an average shoreline slope of twenty to twenty-five degrees. Other smaller wetlands occur locally along streams both above and below Whiskeytown Dam. Little is known about the distribution and abundance of aquatic plants in and around Whiskeytown Lake.

Field Methods

In summer 2003, 67 target aquatic sampling sites were selected along the perimeter of Whiskeytown Reservoir. Out of this pool of samples, 30 sites were selected randomly for field sampling. On July 7-8, 2003, 17 sites were sampled using shoreline surveys and snorkeling. At each site, the crew surveyed a 100-200 m section of shoreline and one person spent fifteen minutes snorkeling the adjacent waters from the surface down to approximately 4 meter depth. Presence and abundance of all species were recorded and specimens were collected. At the same time boat-based crew made three to five benthic tows with a hook.

All specimens from shoreline reconnaissance, snorkel survey, and benthic tows were stored in Ziploc bag with lake water and labeled with location, date, and time recorded.

Post-field processing included rinsing of field samples, separation of different species, and mounting on herbarium paper. Specimen were identified using standard regional sources (REFS), samples for which identification was questionable were verified by Richard Halse of Oregon State University and Lawrence Janeway of California State University, Chico. Species record were input into the National Park Service's NPSpecies database and vouchers presented to park staff for inclusion into the park herbarium. Data are under

Thornton, K.W., B.L. Kimmel, F.E. Payne. 1990. Reservoir Limnology: Ecological Perspectives. John Wiley and Sons, Inc.

National Park Service. 2004. Factors Determining the Recreational Benefits of Reservoirs. http://www.cr.nps.gov/history/online_books/colorado/chap5n.htm#57 accessed on 12/27/2004.